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FLOOD INSURANCE STUDY

COMPLETED

CITY OF COMMERCE, MISSOURI

SCOTT COUNTY

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REVISED:

SEPTEMBER 2, 1988

Federal Emergency Management Agency

COMMUNITY NUMBER - 290410

ORIGINAL

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

This publication incorporates revisions to the original Flood Insurance Study. These revisions are presented in Section 9.0.

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FLOOD INSURANCE STUDY

CITY OF COMMERCE,
SCOTT COUNTY, MISSOURI

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Flood Insurance Study is to investigate the existence and severity of flood hazards in the City of Commerce, Scott County, Missouri, and to aid in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to convert the City of Commerce to the regular program of flood insurance by the Federal Insurance Administration. Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain management.

1.2 Coordination

A search for existing information pertaining to past floods was made through newspapers, city records, and interviews with local residents and municipal officials. Letters were sent to the Bootheel Regional Planning Commission, the Soil Conservation Service (SCS), and the Department of Housing and Urban Development, Federal Insurance Administration requesting published information pertinent to the study. A meeting was held with the U.S. Army Corps of Engineers - Memphis District (COE), to obtain existing data on the drainage ditches in the study area.

On June 29, 1977, the results of the work completed by Russell and Axon were reviewed at a final coordination meeting attended by personnel of Russell and Axon, the Federal Insurance Administration, and the City of Commerce; the study was accepted.

1.3 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968, as amended.

The hydrologic and hydraulic analyses for this study were performed by Russell and Axon for the Federal Insurance Administration, under Contract No. H-4029. This work, which was completed in January 1977, covered all significant flooding sources affecting the City of Commerce.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated limits of the City of Commerce, Missouri. The area of study is shown on the Vicinity Map (Figure 1).

The areas studied by detailed methods were selected with priority given to all known flood hazard areas, areas of projected development and proposed construction until 1982.

The scope and methods of study were proposed to and agreed upon by the Federal Insurance Administration.

Commerce Creek and the Mississippi River within the corporate limits were studied in detail.

2.2 Community Description

The City of Commerce, Missouri is located in mid-eastern Scott County along the western bank of the Mississippi River. Scott County is located in the southeastern part of the State of Missouri, commonly known as the Bootheel. Commerce is approximately 15 miles south of Cape Girardeau, Missouri and 15 miles east of Chaffee, Missouri.

Commerce is served by Missouri Secondary Routes N and E. The community is approximately eight miles from the nearest interchange with Interstate 55. There are no rail, motor freight, or large facilities available in Commerce. It is eight miles to the nearest rail depot which is serviced daily by the Cottonbelt Railroad. The nearest public airport is ten miles away.

The population of Commerce decreased from 360 in 1950 to 234 in 1970. During the same period the population of Scott County increased slightly, from 32,842 to 33,250 (Reference 1). This population trend is characteristic of the small rural communities in the Bootheel because of the migration to the urban communities nearby.

The climate conditions are typical of the mid-south regions of the United States. The average mean temperature is 57 degrees Fahrenheit (F.) and the annual precipitation is 53 inches. The summers are very warm and humid and the winters are mild with little or no snowfall. In this area, growing seasons between frosts are approximately 200 days (Reference 2).

Surface drainage for the lowland areas in Commerce is provided by the Mississippi River, which flows to the east of the city. Commerce Creek, to the north of Commerce, drains the highland areas and flows into the Mississippi River.

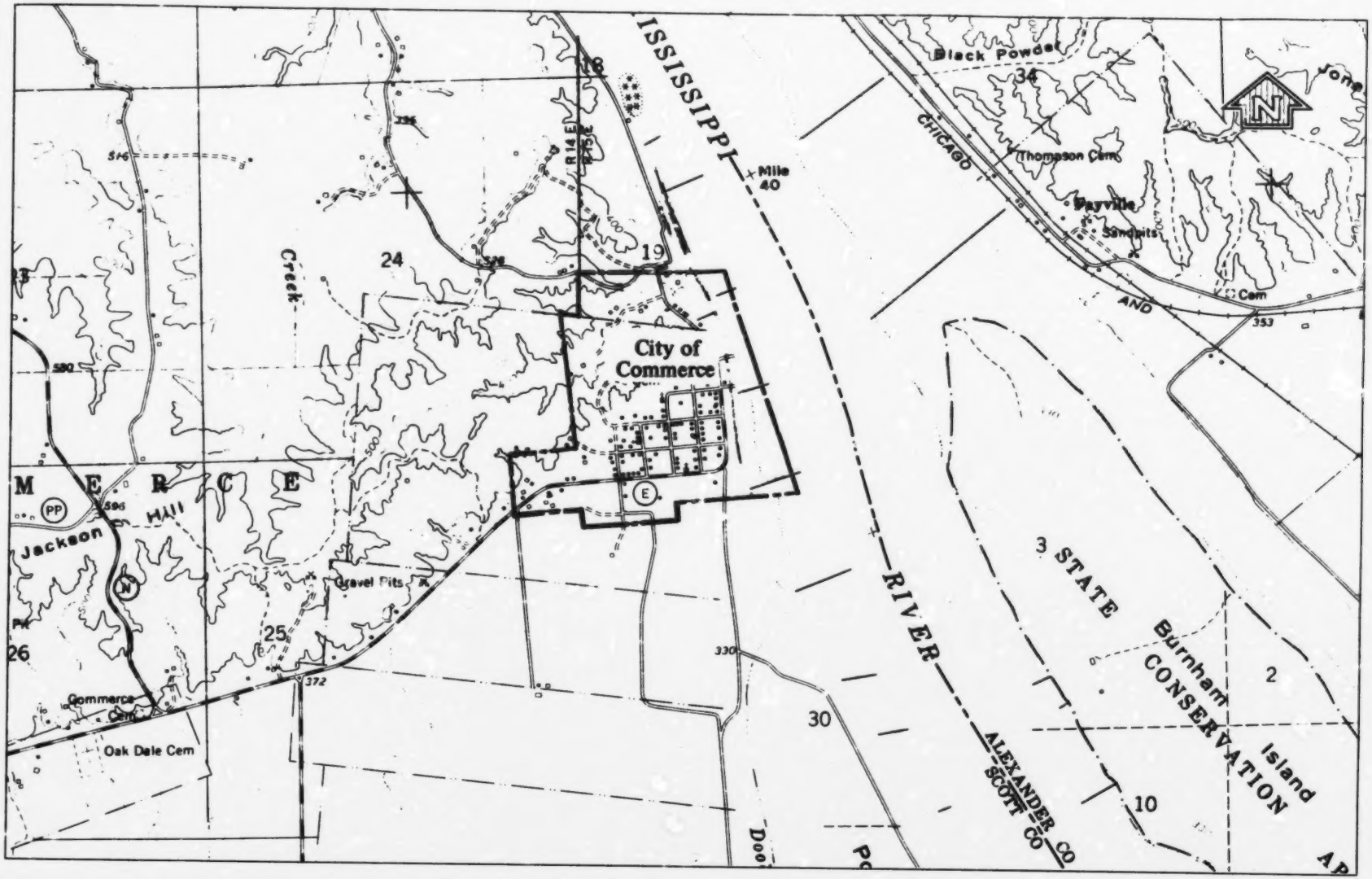

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF COMMERCE, MO
(SCOTT CO.)

APPROXIMATE SCALE
2000 0 2000 4000 6000 FEET

VICINITY MAP

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The eastern and southeastern lowland sections of Commerce, representing over one-half of the corporate area, are located in the 100-year flood plain of the Mississippi River. Residential development has been concentrated primarily in the flood plain area, although recent residential development occupies the upland areas.

Commerce is located near the end of a flat alluvial area that converges with steeply sloped hillsides. The Commerce - Caruthersville Soil Association is the most prominent soil in the low lying area. These soils consist mainly of silty loam and silty clay loam. Vegetation within the study area is limited to small trees, brush, and private lawns, with farm crops to the south and dense trees in the hillsides to the northwest.

2.3 Principal Flood Problems

The principal flood problems in the study area are caused by flooding of the Mississippi River. Low lying areas along the east and southeast sections of the city are susceptible to flooding by the river. The flood stage for the Mississippi River at Commerce is 325.9 feet.

The largest flood of record occurred in the spring of 1973. The exact stage for this flood was not established; however, the flood stage was interpolated using the reading at the Cape Girardeau gaging station located approximately 13 miles north of Commerce, yielding an estimated flood stage of 338.8 feet. The 1973 flood was approximately equal to a sixty-year event. There are no records of past floods on Commerce Creek located in the north of town. The creek has experienced flooding which results from backed up flows from the Mississippi River.

Figure 2 shows the 100-year flood elevation at Water and Washington Streets; Figure 3 shows the eastern section of Commerce during the 1973 flood.

2.4 Flood Protection Measures

The City of Commerce has no substantial flood protection from either the Mississippi River or Commerce Creek (located in the northern section of the city). A levee does provide 500-year protection, but only to a small portion of the community near the southern corporate limit.

3.0 ENGINEERING METHODS

For flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Floods having recurrence intervals of 10-, 50-, 100-, and 500-years have been selected as having special significance for flood plain management and for flood insurance premium rates. The analyses reported here reflect current conditions in the watersheds of the streams.

FIGURE 2. The Southwest Corner of Water and Washington Streets, June 24, 1977. The 100-year Flood Elevation is shown.

Commerce, Missouri

FIGURE 3. Looking at the Eastern Section of Commerce March 1973. The Flood Elevation is 338.8, approximately a Sixty-Year Frequency Flood.

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3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each stream studied in detail in the community.

Pertaining to the detailed study of Commerce Creek, there are no stream flow records for the ditches in the Commerce area that can be used to define discharge-frequency relationships. The 10-, 50-, 100-year relationships were developed by regional frequency rainfall analysis and "Magnitude and Frequency of Missouri Floods" published by Missouri Geological Survey and Water Resources (Reference 3).

Discharge-frequency relationships for the Mississippi River were obtained from "Mississippi River Profiles - Birds Point, Missouri to Lock and Dam 26," that were developed from Mississippi River Model Tests in 1975 (Reference 4).

Discharge for the 500-year flood for Commerce Creek was determined by straight line extrapolation of a log-probability graph of flood discharges computed for frequencies up to 100-years.

Peak discharges for the 10-, 50-, 100-, and 500-year floods of streams in the study area are shown in Table 1.

TABLE 1: SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
COMMERCE CREEK					
At Confluence with Mississippi River	0.39	550	1,080	1,400	2,300
Just Upstream of Western Corporate Limits	0.19	395	780	1,015	1,700
MISSISSIPPI RIVER		777,500	1,025,00	1,140,000	1,460,000

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the streams in the community are carried out to provide estimates of the elevations of the floods of the selected recurrence intervals along each stream studied in detail.

Water-surface profiles for Commerce Creek were developed using the COE HEC-2 computer program (Reference 5). Cross section data for streams in the area were obtained by field survey. All bridges and culverts were surveyed to obtain elevation data and structural geometry. Roughness coefficients were estimated by hydraulic engineers during field inspections of the cross sections. The roughness values for the main channel were 0.060, while the values for the overbanks were 0.045.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway is computed (Section 4.2), selected cross section locations are shown on the Flood Boundary and Floodway Map (Exhibit 2).

Starting water-surface elevations for Commerce Creek were determined by rating curves. Stage frequency relationships for the Mississippi River were obtained from Mississippi River Profiles - Birds Point, Missouri to Lock and Dam 26 (Reference 3).

Flood profiles were determined for the 10-, 50-, 100-, and 500-year floods, and were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

The hydraulic analyses for this study are based only on the effects of unobstructed flow. The flood elevations as shown on the profiles (Exhibit 1) are, therefore, considered valid only if hydraulic structures, in general, remain unobstructed and if channel and overbank conditions remain essentially the same as ascertained during this study.

All elevations are referenced from National Geodetic Vertical Datum of 1929 (NGVD); elevation reference marks used in the study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

A prime purpose of the National Flood Insurance Program is to encourage state and local governments to adopt sound flood plain management programs. Each Flood Insurance Study, therefore, includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the Federal Insurance Administration as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100-year and the 500-year flood have been delineated using the elevations determined at each cross section; between cross sections the boundaries

were interpolated using topographic maps at a scale of 1:2400, with a contour interval of five feet (Reference 6). Because no cross sections were taken for the Mississippi River, the flood elevations were taken from flood profiles and flood boundaries were delineated using the above-mentioned topographic maps.

The levee near the southern corporate limit defines the 100-year and 500-year boundary of the Mississippi River for a short distance.

In cases where the 100-year and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

The boundaries of the 100-year and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 2). Small areas within the flood boundaries may lie above the flood elevations, and, therefore, not be subject to flooding; owing to lack of detailed topographical information or to limitations of the map scale, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity and increases flood heights, thus increasing flood hazard in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment in order that the 100-year flood be carried without substantial increases in flood heights. As minimum standards, the Federal Insurance Administration limits such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced.

The floodway for the study reach of the Mississippi River was determined by representatives of the National and Regional Federal Insurance Administration and Russell and Axon, and city officials. The floodway boundaries were designated at an average distance of 200 feet from the top of bank of the Mississippi River. The floodway selected does not exceed the maximum 1.0 foot surcharge criteria.

The floodway recommended for Commerce Creek was computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations are tabulated at selected cross sections for Commerce Creek (Table 2).

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were determined at cross sections; between cross sections, the boundaries were interpolated.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (FEET NGVD)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE (FEET)
COMMERCE CREEK								
A	0.251	374	515	2.8	343.4	333.0[4]	333.5[4]	0.5
B	0.282	300	1253	1.1	343.4	336.4[4]	336.4[4]	0.0
C	0.395	70	201	7.0	343.4	338.9[4]	338.9[4]	0.0
D	0.560	45	204	6.9	355.1	355.1	355.4	0.3
MISSISSIPPI RIVER								
A	39.6[2]	4400[3]	161,162	7.1	343.4	343.4	343.4	0.0

[1]MILES ABOVE MOUTH
[2]MILES ABOVE MOUTH OF OHIO RIVER
[3]THIS WIDTH EXTENDS BEYOND CORPORATE LIMITS
[4]ELEVATIONS WITHOUT CONSIDERING BACKWATER EFFECT FROM MISSISSIPPI RIVER

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TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF COMMERCE, MO
(SCOTT CO.)

FLOODWAY DATA

COMMERCE CREEK—MISSISSIPPI RIVER

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 4.

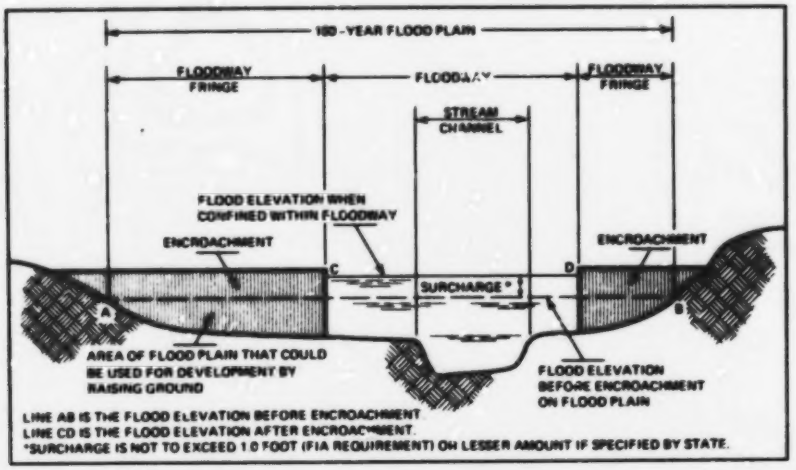
100-YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE *
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE AB IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE CD IS THE FLOOD ELEVATION AFTER ENCROACHMENT.
*SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FIA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FIGURE 4. Floodway Schematic

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the Federal Insurance Administration has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for each flooding source affecting the City of Commerce.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

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Average Difference Between 10- and 100-year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot

Two reaches meeting the above criteria were required for the flooding sources in the Commerce area, including one reach each on Commerce Creek and the Mississippi River. The location of the reaches are shown on the Flood Profiles (Exhibit 1).

5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is the Federal Insurance Administration device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their Flood Hazard Factors are used to set actuarial insurance premium rate tables based on Flood Hazard Factors from 005 to 200.

The Flood Hazard Factor for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest one-half foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the Flood Hazard Factor is 005; if the difference is 1.4 feet, the Flood Hazard Factor is 015; if the difference is 5.0 feet, the Flood Hazard Factor is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the Flood Hazard Factor is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective Flood Hazard Factors, the entire corporate area of the City of Commerce was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A3, A9:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones assigned according to Flood Hazard Factors.
Zone B:	Area between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain

that are protected from the 100-year flood by dike, levee, or other water control structure; or areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot. Zone B is not subdivided.

Zone C: Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, Flood Hazard Factors, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the City of Commerce is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the Federal Insurance Administration.

6.0 OTHER STUDIES

There are no Flood Insurance Studies or any other published reports or data dealing with flood problems in the study area. A Flood Insurance Study for Pemiscot County, Missouri is under preparation (Reference 7).

This report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the National Flood Insurance Program.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic and other pertinent data used in this study can be obtained by contacting the office of the Federal Insurance Administration, Regional Director, Federal Office Building, 911 Walnut Street, Kansas City, Missouri 64106.

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
MISSISSIPPI RIVER REACH 1	0001	-4.60	-1.40	2.60	045	A9	VARIES-SEE MAP
COMMERCE CREEK REACH 1	0001	-1.65	-0.55	1.05	015	A3	VARIES-SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF COMMERCE, MO
(SCOTT CO.)

FLOOD INSURANCE ZONE DATA

MISSISSIPPI RIVER - COMMERCE CREEK

8.0 REFERENCES AND BIBLIOGRAPHY

1. U.S. Bureau of the Census, Final Report PC (1) - A27 Missouri, U.S. Census of Population: 1970 Number of Inhabitants, U.S. Government Printing Office, Washington, D. C.

2. Missouri Division of Commerce and Industrial Development, "Commerce, Missouri Community Profile," Jefferson City, Missouri 1975.

3. Missouri Geological Survey and Water Resources, "Magnitude and Frequency of Missouri Floods," E. H. Sandhaus and John Skelton.

4. U.S. Army Corps of Engineers, Mississippi River Profiles, Birds Point, Missouri to Lock and Dam 26, 1975.

5. ————————, Hydrologic Engineering Center, HEC-2 Water-Surface Profiles, Generalized Computer Program, Davis, California, October 1973.

6. Russell and Axon, Topographic Maps (developed from Aerial Photos), Scale 1:2400, Contour Interval five feet: Commerce, Missouri 1977.

7. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Pemiscot County, Missouri (under preparation).

Houck, Louis, History of Missouri, R.R. Donnelly and Sons Company, 1908.

U.S. Army Corps of Engineers, Sacramento District, Civil Works Investigations, "Statistical Methods in Hydrology," L.R. Board, 1962.

U.S. Department of Housing and Urban Development, Federal Insurance Administration, "Guidelines and Specifications," January 1976.

U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24000, Contour Interval 20 feet: Thebes, Missouri 1955.

U.S. National Weather Service, Technical Paper No. 40, "Rainfall Intensity - Duration - Frequency Curves," U.S. Government Printing Office, Washington, D. C., 1961.

————————, Technical Paper No. 49, "Rainfall Intensity - Duration - Frequency Curves," U.S. Government Printing Office, Washington, D. C., 1964.

*U.S. GOVERNMENT PRINTING OFFICE:1978 720-341/8862 1-3

9.0 REVISIONS DESCRIPTION

This section has been added to provide information regarding significant revisions made since the original Flood Insurance Study was printed. Future revisions may be made tnat do not result in the republishing of the Flood Insurance Study report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood hazard data located at the Mayor's Office, Commerce, Missouri.

9.1 First Revision (Revised September 2, 1988)

a. Acknowledgments

The hydraulic analyses for this Revisions Description were performed by the U.S. Army Corps of Engineers (COE), St. Louis District, Missouri. The Federal Emergency Management Agency reviewed and accepted these data for purposes of this revision.

b. Scope

The floodway was revised for the entire reach of the Mississippi River within the City of Commerce.

c. Hydrologic and Hydraulic Analyses

The floodway revision for the Mississippi River was based on HEC-2 hydraulic analysis (Reference 8) provided by the COE. The floodway was delineated by the COE using a topographic map at a scale of 1:24000 with a contour interval of 20 feet (Reference 9).

d. Floodways

Floodway computations for the Mississippi River were revised as a result of new hydraulic analysis. The floodways were computed on the basis of a conveyance reduction from each side of the floodplain. The results of these computations were tabulated at selected cross sections for each stream segment for which a floodway was revised and are presented in Table 2, Floodway Data.

The area between the floodway and the 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point.

e. Insurance Application

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 100-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

The reach determinations, Flood Hazard Factors, and flood insurance zones presented in Sections 5.1, 5.2, and 5.3 of this report and Table 2, Flood Insurance Zone Data, are no longer applicable.

f. Other Studies

The Flood Insurance Study for Scott County, Missouri (Reference 10) is being revised in conjunction with this study and will be in agreement with this study.

g. References and Bibliography

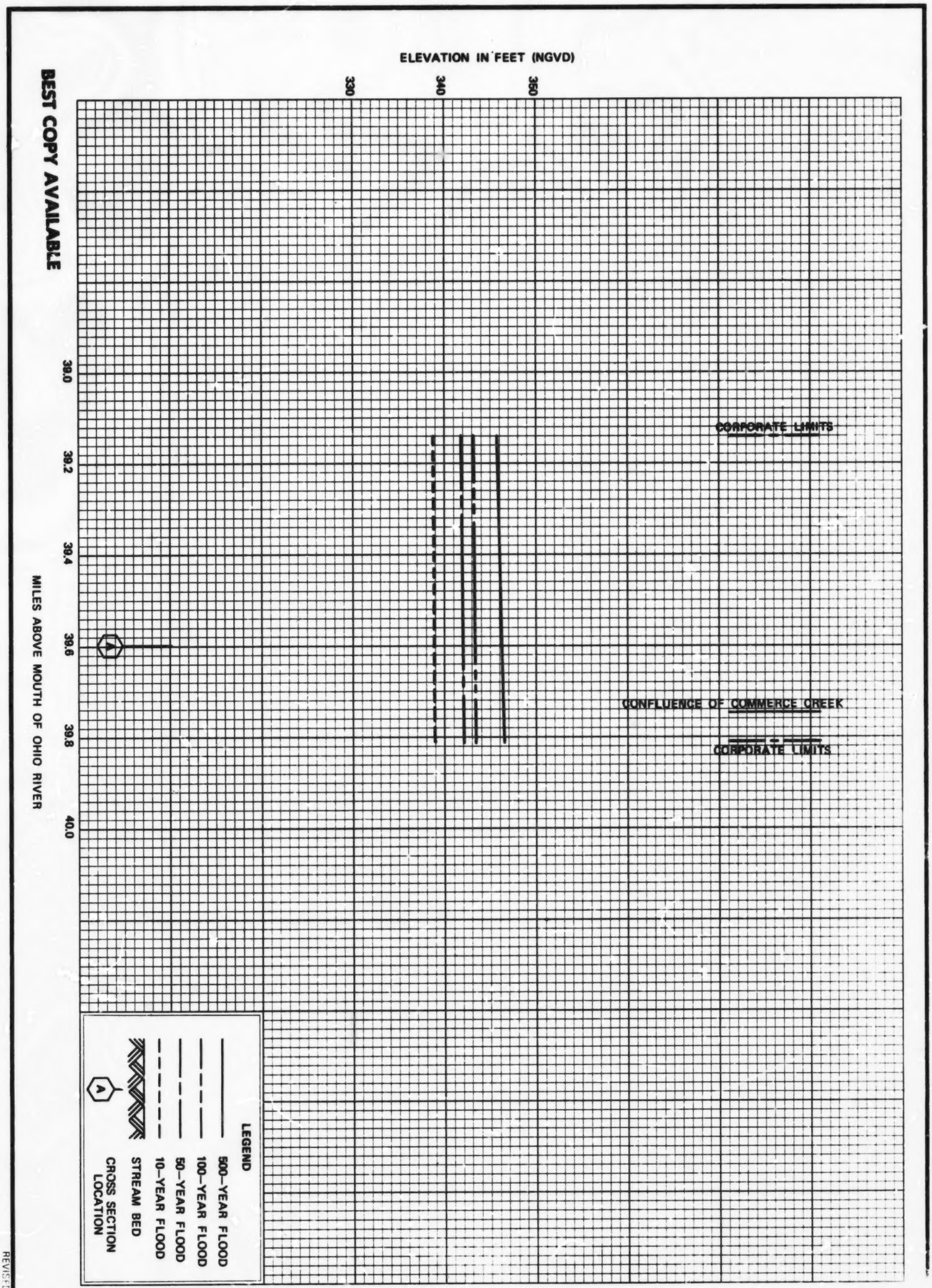
8. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water-Surface Profiles, Generalized Computer Program, Davis, California, April 1984.

9. U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24000, Contour Interval 20 Feet: Thebes, Missouri, 1966.

10. Federal Emergency Management Agency, Flood Insurance Study, Scott County, Unincorporated Areas, Missouri, revision in progress.

ELEVATION REFERENCE MARKS

REFERENCE MARK	FLOOD INSURANCE RATE MAP PANEL	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1	0001	334.47	top of railroad spike in east side of power pole in southeast corner of T Road and State Highway E intersection, south to levees and Powers Island, about 300 feet west of west edge of the Mississippi River
2	0001	358.22	railroad spike in southwest base of power pole about 100 feet northeast of Mr. Wright's house on north side of wye intersection, about 500 feet northwest of Anderson Cemetery
3	0001	356.90	top of railroad spike in south base of power pole on north side of State Highway E, stamped on west side of pole No. 535
4	0001	338.88	top of miners spike in north side of 48-inch cottonwood tree about 100 feet north of Walkers store on east side of Water Street



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01P	FEDERAL EMERGENCY MANAGEMENT AGENCY CITY OF COMMERCE, MO (SCOTT CO.)	FLOOD PROFILES MISSISSIPPI RIVER

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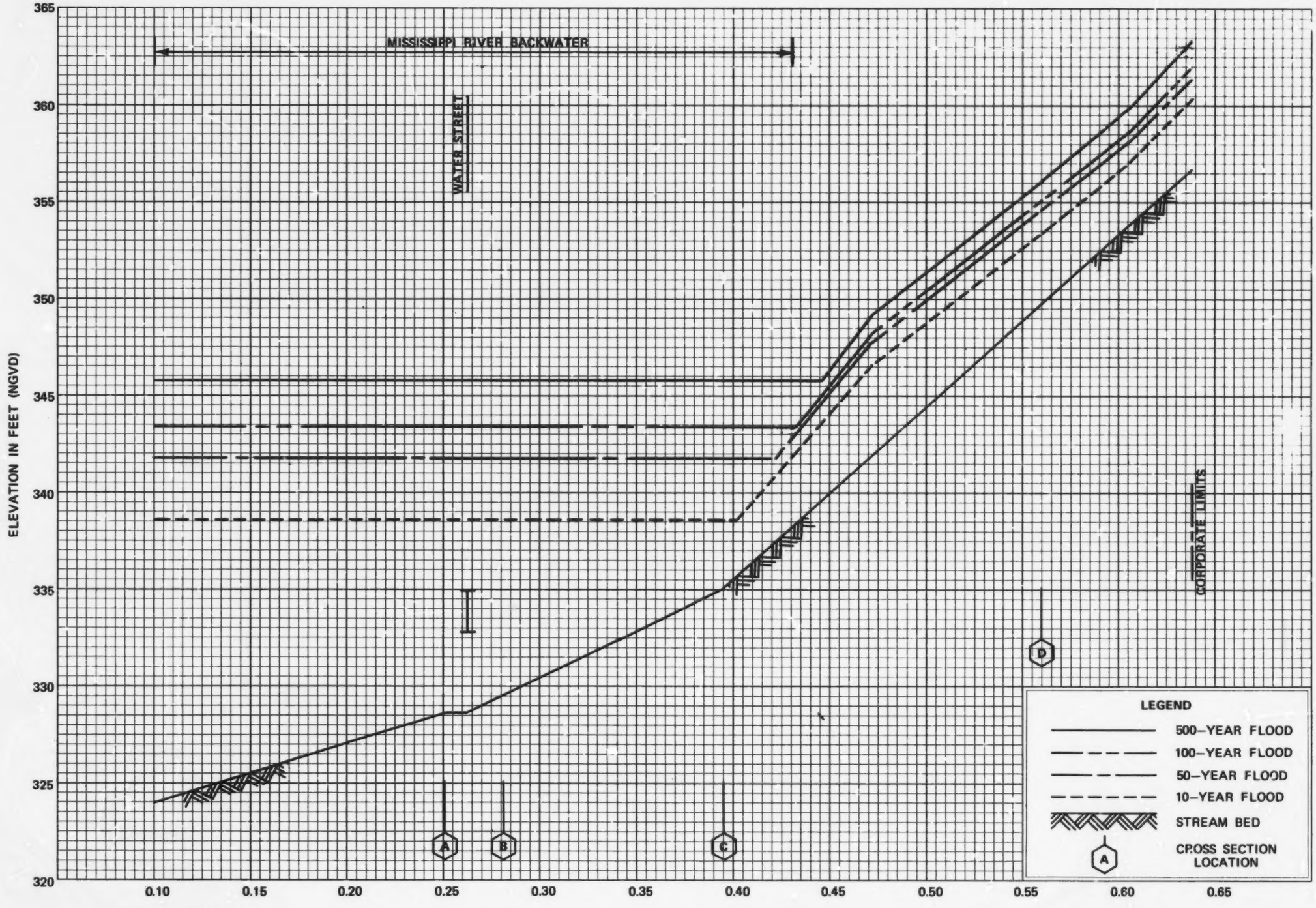

FLOOD PROFILES

COMMERCE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF COMMERCE, MO
(SCOTT CO.)

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